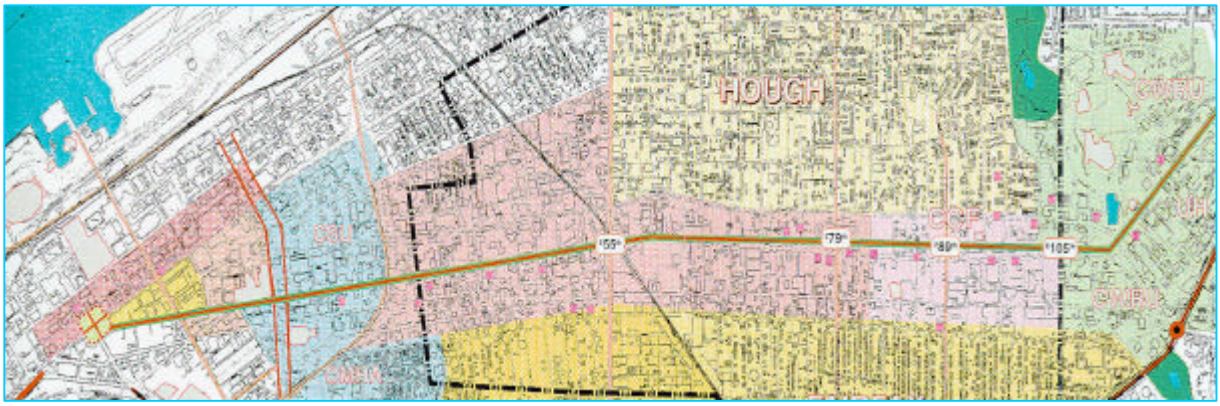
U.S. Department of Transportation

Greater Cleveland Regional Transit Authority

Federal Transit Administration

Federal Transit Administration
Bus Rapid Transit Demonstration Program

GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY
EUCLID AVENUE IMPROVEMENT PROJECT



1. Project Description

- **Type of Project**

The Euclid Corridor Bus Rapid Transit (BRT) Project has three key components – the Euclid Avenue transit improvements featuring the creation of an exclusive center median busway with Electric Trolley Buses along Euclid Avenue from Public Square to the University Circle area, the creation of a Transit Zone on St. Clair and Superior Avenues that uses exclusive transit lanes, and the construction of a new intermodal transfer facility.

The Euclid Avenue corridor, one of the oldest areas in the City of Cleveland, continues to undergo redevelopment. From a turn of the century residential area of mansions to a commercial area in the 1940's and 1950's, Euclid Avenue, the City's "Main Street," is being redeveloped with commercial, office, hotel, residential, and retail facilities. Active local development corporations work successfully with the City, County, private developers, and property owners to undertake redevelopment concurrent with this BRT project. Sixty percent of the Greater Cleveland Regional Transit Authority's (GCRTA) rail and bus boardings occur in the corridor.

The Euclid Avenue Transit Improvement features an **exclusive center median busway** which will connect the region's largest employment center, the central business district, with the University Circle area, the second largest employment center and the major cultural,

medical and educational district. The exclusive center median busway will segue to the curb at University Circle where the electric trolley buses will continue into the neighboring City of East Cleveland to GCRTA's most highly used rapid transit station, the Stokes Station at Windermere.

A complete building to building reconstruction of Euclid Avenue is planned, with enhanced pedestrian zones, significant sidewalk and center median landscaping, new street and sidewalk lighting, new center median platform stations, and new exclusive bus and auto lanes.

The **transit zone** will improve the operational constraints of the existing downtown street network and increase the amount of bus service that can be provided effectively during peak periods. Motorcoach bus traffic will be directed into and out of the transit zone on two north/south streets with auto traffic directed to a third north/south street. The main east/west streets of the transit zone will have exclusive curbside bus lanes. The transit zone will allow better distribution of bus riders to work destinations within the central business district.

The new **intermodal transfer facility** will integrate Euclid Avenue bus service and other suburban bus routes with the rapid transit line which connects to the central business district and, from there, the airport. A significant percentage of the proposed new ridership in the Euclid Avenue corridor will come from the bus/rail transfers at this facility.

- **Method of Operations**

The exclusive center median busway on Euclid Avenue will extend from Public Square in downtown Cleveland to approximately Stearns Road, west of the University Circle area. Median lanes and center platform stations are proposed for the downtown segment of Euclid Avenue. Median lanes and side platform stations are proposed from East 17th to East 107th Streets. The center median busway lanes will end at Stearns Road. The electric trolley buses will operate exclusively in the busway from Public Square to East 17th Street, with passenger loading/unloading through left side doors. The electric trolley buses and other GCRTA bus routes will use the Euclid Busway east of East 17th street. Passenger loading/unloading at busway stations in this section will be through right side doors.

The electric trolley buses will be low floor, 60' articulated, rubber-tired buses with both left and right side doors to facilitate boarding from both the center median platform stations and curbside stations. All stop locations east of East 17th Street will be split for side platform stations.

The transit zone will "rationalize" the distribution of transit traffic in downtown Cleveland by logically locating bus stops for both west- and eastbound routes. The zone is bounded on the north by St. Clair and on the south by Superior Avenue, and utilizes north/south arterial roads to funnel motorcoach traffic. Motorcoach buses will operate in exclusive

lanes at the curb on Superior Avenue and in exclusive lanes at the curb during peak hours on St. Clair.

The north/south arterial roads of East17th and East 18th Streets will facilitate traffic flows into and out of the transit zone. East 17th Street will be limited to buses and local auto traffic north of Euclid Avenue, with Euclid Avenue extended one block south for buses only. East 18th Street will carry auto traffic only between the inner belt and the northern edge of the central business district.

- **Service Levels**

The current, most highly traveled bus route linking the two employment centers, Public Square and University Circle, will be converted to the electric trolley bus route. Proposed service levels for the new electric trolley bus route are:

Proposed Electric Trolley Bus Service Plan		
Day of Week	**Peak/Base Period**	**Evening Period**
Weekday	5 minutes	15 minutes
Saturday	5 minutes	15 minutes
Sunday	15 minutes	15 minutes

Proposed service levels on Euclid Avenue for all transit vehicles including electric trolley buses and motorcoach buses are 2.1 minutes, during peak periods.

- **Estimated Time Savings**

From Public Square to the Stokes Station at Windermere, travel time savings of 10 minutes (30%) is estimated due to a combination of factors, including the ease of platform boarding, exclusive busway, and traffic signal prioritization.

- **Number and Type of Vehicles Providing Service**

The peak vehicle requirement for electric trolley buses is 24. The total fleet requirement of 30 electric trolley buses includes 6 spare vehicles.

A high spare ratio of 25% or 6 electric trolley buses is assumed. This is because of the relatively small fleet size; the expected high number of bus miles per vehicle that results from the 5-minute service frequencies throughout the day; and the unique nature of the electric trolley buses.

The electric trolley buses will use an overhead catenary system as the power source, similar to light rail transit. Each electric trolley bus will be equipped with doors on both the left and right-hand sides so that buses can stop at median platform stations in the downtown busway segment as well as side platform stations in the mid-corridor segment and street curb bus stops on Euclid Avenue through University Circle to the Stokes Rapid Transit Station. The

electric trolley buses will also have auxiliary power units (APU) that would enable them to operate for short distances without the overhead catenary system, such as the distance between the Stokes Rapid Transit Station and Hayden Garage, where the vehicles will be stored and maintained.

- **Fare Collection and Boarding**

  Fare collection will occur on board transit vehicles. The location of the fare collection mechanism will be determined during final design. A reduced fare zone or a free fare zone may be considered for the lower Euclid Avenue segment where only electric trolley buses will be operated. Proof of payment will also be considered. The capacity for future use of SMART cards will be provided at each bus shelter.

  Boarding on electric trolley buses will occur on the left side in the central business district and on the right side in the remainder of the corridor.

- **Use of ITS Capabilities**

  System-wide voice and data communication system

  A new radio communications system is being procured for system-wide use and will include the Euclid Corridor BRT project. The system will incorporate reliable, wide area coverage, Automatic Vehicle Location, and emergency alerting. Thirteen of 16 channels will be for voice communication and the other three will be data channels. The data channels will provide automated passenger count information and fare collection monitoring.

  Automatic Vehicle Location (AVL) System

  Included will be on board emergency alerting system, traffic signal/bus priority system, passenger on board schedule information, bus stop passenger information displays, and a passenger transfer management system.

- **Traffic Engineering and Infrastructure**

  New traffic control and striping will be installed to conform to the busway design. A new traffic signal system will be installed to give priority to buses operating on Euclid Avenue. This new system will assist in achieving the projected 30% travel time savings.

  A 2' utility chase will be constructed on both sides of Euclid Avenue for traffic signal wiring, street lighting, pedestrian lighting, and spare conduit for future growth. In addition, there will be a new communication duct bank installed to both replace the existing system and provide the capability for new cabling to create a “smart street” concept.

  The Euclid Avenue roadway will be removed and reconstructed to conform to the new busway alignment with landscaped median, bus stop platforms and a rumble strip to separate the bus and auto lanes. Sidewalks will be replaced with upgraded treatments, including

backfilling and/or reconstruction of underground vaults and the addition of amenity strips with tree lawn and unit pavers. New pedestrian lighting and signage kiosks will be included.

On-street parking will be eliminated on lower Euclid Avenue, and reduced on outer Euclid Avenue. Curb cuts will be used for general loading zones and drop-off zones as needed.

2. Problems Addressed by the Project

Increased efficiency of current bus and rail service.

Travel time and the quality of service will be improved with the introduction of electric trolley buses in an exclusive busway with signal priority and the connection provided by the new intermodal transfer facility.

The transit-restricting nature of the existing street network will be eliminated with the introduction of the downtown transit zone. Congestion in and adjacent to the BRT area will be reduced.

Reversal of declining population and jobs trend.

Higher density, transit-oriented development in the Bus Rapid Transit area will occur in an area whose neighborhoods have lost substantial numbers of residents and businesses in recent decades.

The Metropolitan Planning Organization projections indicate that the downward trend will subside in the year 2000 based on development which is currently occurring and that is planned to be concurrent with the Euclid Avenue Bus Rapid Transit improvements.

Improved quality of life for those visiting, working or living in the Euclid Avenue corridor.

The livability of the pedestrian environment will be improved through improved streetscapes, amenities and public safety enhancements. The increased transit ridership will serve as a catalyst for increased community activities and development.

Regional access to employment, medical, educational, and cultural centers will be improved both in and adjacent to the Euclid Avenue corridor.

Regional air quality will be improved by replacing diesel buses with clean air vehicles, and reducing traffic congestion.

3. Implementation and Operations Schedule

Begin final design	10/1/99
Complete final design/ Begin construction	2001
Complete construction	2003-2004

4. Funding Plan

Federal New Starts	State of Ohio	GCRTA	City of Cleveland	Total
$144M	$50M	$23M	$17M	$234M

5. Issues of Concern re: planning, design, implementation and/or operations

Planning & Design

The presence of basement areaways precludes tree planting, so the City of Cleveland's discussions regarding the abandonment of these areaways must be considered. Utility vaults also conflict with proposed tree planting plans and must be considered.

The extent of utility relocations (i.e., water, sewer, steam, chilled water, gas, and electric) and telecommunications must be evaluated. The roadway configuration, which impacts turn lane locations, driveway locations and size, parking, standing and loading zones, and locations of bus stops, needs to be finalized.

Traffic signal phasings, location of detection check points for AVL information, and signal timing guidelines are needed. The streetscape identity, light pole design, sidewalk paving patterns, tree and shrub types, shelter architecture, and graphics need to be finalized.

The GCRTA and the Massachusetts Bay Transportation Authority (MBTA) are pursuing a joint procurement. MBTA is seeking to procure several types of vehicles, including a dual mode, electric trolley/clean diesel coach vehicle with right side boarding. The GCRTA is seeking a dual mode, electric trolley bus, with limited off wire capability and both left and right side boarding. The joint procurement anticipates a large pool of prospective vendors, which will provide for a competitive price. However, unusual features of the vehicles (i.e., left and right side doors, low floors, unproven technologies) suggest that the procurement may be complicated.

Implementation

Avoidance of business interruption during roadway construction is a significant concern. Mitigating the impact of unknown utilities and abandoned trolley tracks is also an issue.

Operations

Fare collection, complicated by both left and right side boardings and the limited access (electric trolley bus only) busway in lower Euclid Avenue, must be determined.

6. Current Status

The Euclid Corridor BRT is currently continuing Preliminary Engineering pending FTA approval to proceed to final design.

7. Contact

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